Appl. No. 10/005,279

Amdt. dated August 30, 2004

Reply to Notice of Allowance of June 16, 2004

Amendments to the Specification:

Please replace the paragraph beginning at page 9, line 23 with the following amended paragraph:

--In addition, the two-stage fixed bed section of the gasifier consumes essentially all tars

and oils while converting some of the fixed-carbon to activated carbon char within the gasifier.

Some of this activated carbon char may be used in the cleanup system as a multi-pollutant

absorbent for undesirable gaseous species.--

Please replace the paragraph beginning at page 13, line 26 with the following amended

paragraph:

--Sized activated carbon char is mixed with the incoming syngas in a mixer 60 just

upstream of the baghouse 59. The mixing of the syngas and activated carbon char carries the

activated carbon char into the baghouse and lines the bags. The activated carbon char collects on

the bags in the baghouse 59. This active activated carbon char is very effective in absorbing the

various pollutants at these lower temperatures in the range of 275°F to 350°F. Commercial active

carbon is very expensive, often over \$1000 per ton, so it is not normally used for large-scale

gaseous fuel cleanup. But in the present invention, the activated carbon char is a byproduct from

the gasifier, and it is no more expensive than the fuel it came from.--

Please replace the paragraph beginning at page 14, line 4 with the following amended paragraph:

-- There are two methods in which activated carbon char is created within the gasifier.

The first is in the upper fixed bed section of the gasifier at about point 13. The second area is in

the entrained flow section. By intentionally sizing the fine solids to a size in which a portion of

the particle is not fully gasified but is carried out as particulate with the syngas, this particle will

have been exposed to very high temperatures to ensure activation.--

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Please replace the paragraph beginning at page 14, line 9 with the following amended paragraph:

--The activated carbon char can leave the gasifier in two ways, either entrained with the effluent gas or directly removed from the fixed bed. Fine particles may be entrained with the effluent syngas by originating in the entrained flow section discussed above or from particulate that has broken off of larger coarse fuel from the fixed bed fuel regions. The second method of obtaining active activated carbon char is by extraction tubes 61. The extraction tube is a slanted double pipe that penetrates the gasifier fuel bed just below bed surface at point 9. By creating a slightly lower pressure on the outside end the tube will act as a vacuum to bring the active activated carbon char out. The pipe is double walled with a water jacket between the two pipes to cool the extraction tube 61. If the gasifier produces enough active activated carbon char entrained with the effluent syngas to meet the pollution control needs, the second method is not needed.--

Please replace the paragraph beginning at page 14, line 19 with the following amended paragraph:

--The extracted partially cooled active activated carbon char is then pulverized 62, before going on to the particulate cooler 63 where it may join with the collected material from the particulate removal system. The activated carbon char is then pulverized to the desired fineness at point 62. Pulverized activated carbon char is then injected into a mixer 60, which carries the active activated carbon char on into the baghouse 59.--

Please replace the paragraph beginning at page 15, line 6 with the following amended paragraph:

--The fuel pieces in the bed at point 9, Figure 3 of the gasifier are a mixture of ash and fully activated carbon char. The activated carbon char created in the present invention is not blinded by tars and oils that would normally exist in other fixed bed or some fluidized bed gasification systems. Different coarse fuels will have differing degrees of ability to convert to

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activated carbon <u>char</u>. Fuels with lower ratios of volatiles to fixed carbon content may not be as well suited as fuels that have a higher ratio of volatiles to fixed carbon content.--

Please replace the Abstract of the Disclosure with the following amended Abstract:

--A gasifier is disclosed combining a fixed bed gasification section where coarse fuel is gasified and an entrained flow gasification section where fine fuel is gasified. The fixed bed section includes upper and lower sections. Coarse fuel is devolatilized in the upper fixed bed section and subjected to elevated temperatures sufficient to crack and destroy tars and oils in the effluent gases. The entrained flow gasification section is disposed in a lower plenum adjacent the lower fixed bed section. A plurality of injection ports are configured to introduce oxygen, steam, or air into different sections of the gasifier to control temperature and operating conditions. Activated carbon char may be formed in the upper fixed bed section and in the entrained flow section. The activated carbon char may be used as a sorbent to remove pollutants from the effluent gases. The gasifier may be used with various coarse and fine fuel feedstocks.--